

CLAIMS

What is claimed:

1. A method of packaging an optical module using flip chip bonding, the method comprising:

preparing an optical device chip which is comprised of an input/output pad formed on a substrate, an under bump metal layer formed on the input/output pad, and a solder bump formed on the under bump metal layer to transmit an electric signal to the outside;

preparing a silicon wafer to rearrange input/output terminals of the optical device chip and passively align an optical fiber with the optical device chip;

forming a plurality of through holes in the silicon wafer at predetermined intervals;

forming an under ball metal layer at the surface of the silicon wafer;

forming a solder ball on the under ball metal layer to transmit an electrical signal from the solder bump to the outside;

flip-chip-bonding the optical device chip to the silicon wafer;

manufacturing an optical sub module by cutting the silicon wafer; and

optically coupling the optical device chip with the optical sub module by inserting the optical fiber into the through hole of the optical sub module to be aligned with the optical device chip.

2. The method of claim 1, wherein preparing the optical device chip comprises:

manufacturing optical devices each including an input/output pad formed on a substrate;

forming an under bump metal layer on the input/output pad;

forming a solder bump on the under bump metal layer on the input/output pad; and

obtaining an individual optical device chip by cutting the substrate, on which the solder bump is formed.

3. The method of claim 1, wherein the through hole is formed by wet-etching or dry-etching the silicon wafer or polishing the back side of the silicon wafer and wet-etching or dry-etching the silicon wafer.

4. The method of claim 1, wherein the silicon wafer is cut into individual wafers, on each of which an array of a plurality of optical device chips is formed.

5. The method of claim 1, wherein the optical fiber is inserted into the through hole of the optical sub module in the manner of passive alignment, in which there is no need to operate an optical device.